ON THE OCCURRENCE OF THE EUROPEAN RIVER LAMPREY, *LAMPETRA FLUVIATILIS* (LINNAEUS, 1758), IN THE IBERIAN PENINSULA.

by

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ABSTRACT. - *Lampetra fluviatilis*, a species whose occurrence in the iberian peninsula was doubtful, is recorded from the River Sorraia (system of the Tejo), in Portugal.

RESUME. - *Lampetra fluviatilis*, espèce dont la présence dans la péninsule ibérique était douteuse, est signalée dans le Sorraia (bassin du Tage), au Portugal.

Key words: Petromyzontidae, *Lampetra fluviatilis*, Portugal, Biogeography.

Lampetra fluviatilis has long been recorded from the iberian peninsula: Machado (1857) in the Guadalquivir; Vieira (1894, 1898), Moller (1894), Nobre (1903), and Seabra (1911) in a stream near Marinha Grande; Osório (1896) at Matozinhos (mouth of the Douro); Gibert (1913) and Borja y Goyeneche (1920) in Cataluña. However, the identity of the species in Iberia has been questioned, first due to the confusion with its satellite species *Lampetra planeri* (Bloch, 1784), and secondly as a consequence of the loss of collections, labels and registration books.

Steindachner (1866a) collected 10 ammocoetes in the river Minho (Tuy) which he identified as *Petromyzon planeri* (= *L. planeri*). Later, he referred (Steindachner, 1866b) to *L. planeri* as an iberian species, and to *L. fluviatilis* (= *Petromyzon fluviatilis*) as very probably also occurring in iberian inland waters. Moller (1897) supported the view that lampreys collected in the stream near Marinha Grande and formerly identified as *L. fluviatilis* (Moller, 1894) were actually *L. planeri*. Gibert (1913) recorded *L. planeri* from Cataluña (besides *L. fluviatilis*). Lozano Rey (1919) identified 3 ammocoetes collected in Pontevedra as *Petromyzon fluviatilis planeri*.

The identity of the iberian *Lampetra* has remained confused. What is the identity of the species that occurred in iberian inland waters? Different answers have been given but it has never been clear whether the authors reporting the occurrence of these species actually examined Iberian specimens.

Lozano Rey (1928, 1935, 1952) referred to both *L. fluviatilis* and *L. planeri*. However, he was never able to obtain iberian specimens and based his work on prior authors. According to Berg (1932), apparently none of the species lives in Iberia. In contrast, both species were said to exist in the iberian peninsula by Hubbs and Potter (1971) and Ladiges (1978), and in Portugal by Helling (1940) and Albuquerque (1956).

L. fluviatilis is the only species recorded from Portugal (Nobre, 1931, 1935; Helling, 1943), Cataluña (Lloris *et al.*, 1984), or the iberian peninsula (Banarescu *et*

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al., 1971; Vladykov and Kott, 1979; Lelek, 1980). According to Vladykov and Kott (1979), *L. planeri* is absent from Iberia; Lelek (1980) considered it to be present.

De Buen (1935) referred to both species in the iberian peninsula, but uncertainly to *L. fluviatilis*.

In 1984, Dr J. Holcík asked one of us (C.A.) to provide information on the distribution of Petromyzontidae in the iberian peninsula, to be included in the first volume of "The Freshwater Fishes of Europe". A revision of the literature and of the specimens stored in Portuguese collections was then done. The specimens identified as *Lampetra* are not properly labelled, and so no positive information could be provided on the distribution of *L. fluviatilis* or *L. planeri* in Portugal or Spain. *L. fluviatilis* was not found during a recent revision of the marine fishes in the collection of the Museum of Madrid (Matallanas *et al.*, 1981).

Meanwhile, Dr J. Holcík kindly provided us with reliable information on ammocoetes taxonomy. A re-examination of the collections was then undertaken, and a number of specimens of *Lampetra* were found. Although these specimens were probably collected in Portugal their labels are missing and therefore their origin remains uncertain. Finally, in December 1985, one specimen of *L. fluviatilis* was collected by one of us (C.-P.), definitely proving the occurrence of the species in the iberian peninsula.

MATERIAL

As discussed above, all the specimens of Petromyzontidae in portuguese collections have been examined. Ammocoetes of *Petromyzon* will also be listed here because they provide useful comparative data for the identification of *Lampetra* ammocoetes. Material examined is stored in the collections of Museu Bocage, Lisbon (MB), Aquário Vasco da Gama, Dafundo (AVG), Museu Zoológico da Universidade de Coimbra (MC), and Instituto de Zoologia "Dr Augusto Nobre", Porto (MP). Total length (TL) of each specimen is given.

Material examined: Adult specimens, *L. fluviatilis*, AVG 3.44, no locality information, 2 specimens, TL = 247 mm (both specimens).

Prespawning adult, *L. fluviatilis*, MB 6.4., Sorraia R. (system of the Tejo), Monte Belo, 2/12/1985, M.J. Collares-Pereira, A.A. Soares, L. Narciso and D. Dias col., TL = 127 mm.

Ammocoetes, *Lampetra sp.*, MP 72, no locality information, 2 specimens, TL = 95 and 112 mm; MP (without number), no locality information, 4 specimens, TL = 73, 77, 80, 85 mm; *Petromyzon marinus*, AVG (without number), Minho R.?, 1927?, 3 specimens, TL = 82, 97, 97 mm; AVG (without number), Minho R.?, Caminha?, 1927?, 2 specimens, TL = 71, 121 mm; MB 6.3., Vagem Grande, Choupal, Coimbra, 13/11/1985, T. Guimarães & A. Quadros col. & don., 11 specimens, TL = 70, 77, 79, 80, 85, 123, 135, 140, 142, 155, 158 mm; MC 2d, Marinha Grande, 2/2/1894, 1 specimen, TL = 140 mm; MP (without number), Foz do Tâmega, 10/6/1963, 1 specimen, TL = 130 mm; MP 71A, no locality information, 1 specimen, TL = 131 mm.

RESULTS

ADULT SPECIMENS OF *L. FLUVIATILIS*

The two specimens examined (AVG) have sharp and well-developed teeth. There are in both 7 teeth on the infraoral lamina. The first dorsal fin is well separated from the second dorsal.

As these specimens are not labelled and there is no registration book to the AVG collection, their locality is not known. They were most probably incorporated in the AVG collection after 1942, since *L. fluviatilis* is not recorded in the catalogue of the fish collection (Conçalves, 1942). The uncertain locality of these specimens is somewhat increased because portuguese fishermen working in the Northern

Atlantic sometimes offer less common specimens to the "Aquário" (Almaça, unpublished).

PRESPAWNING ADULT OF *L. FLUVIATILIS*

The characteristics of this specimen, namely the sharp and pale yellow disc teeth (Fig. 1) and prominent fins (Fig. 2), suggest its inclusion into Potter *et al.* 'stage 7' (Hardisty, 1986a). Other characteristics are as follows: intestine well-developed (2 mm in diameter); a complete ring of 109 oral fimbriae; 6 sharp teeth on the infraoral lamina (formula 1^2-4-1^2); 64 trunk myomeres; dorsal and lateral surfaces silvery, ventral surface whitish (Fig. 3).

AMMOCOETES

The following taxonomic criteria were used to identify the ammocoetes: (1) number of trunk myomeres, (2) pigmentation on the oral hood, (3) pigmentation on the caudal region, and (4) pigmentation on the tongue precursor (Holcík, 1986a; per. comm.). As some of the ammocoetes examined have been preserved in alcohol for a long time, the characters relating to pigmentation could not often be used. Also, the number of oocytes, the only character clearly distinguishing the ammocoetes from *L. fluviatilis* and *L. planeri* (Holcík, 1986b) was not taken into consideration since the specimens of *Lampetra* could not be sectioned (exhibition collections). Hence, these ammocoetes are identified as *Lampetra sp.*, although the only adult stage recorded until now in Iberia is *L. fluviatilis.*

Number of trunk myomeres: As for the number of trunk myomeres, a clear distinction between two groups of ammocoetes is observed (Table I). The group presenting the higher number was identified as *Petromyzon marinus*. In this group the range is identical to that recorded in British *Petromyzon* ammocoetes (69 to 75), but the mean is somewhat higher than the mean for British ammocoetes (71.0-71.6) (Hardisty, 1986b). In fact, this range of means slightly overlaps the 0.95 confidence interval for the mean of Portuguese *Petromyzon* ammocoetes (71.5 to 73.1; Table I).

The group presenting the lower number of trunk myomeres was identified as *Lampetra*. The mean for this group (60.8; Table I) is similar to the mean of different samples of ammocoetes of *L. fluviatilis* (Hardisty, 1986c: Tab. 23) or *L. planeri* (Hardisty, 1986d: Tab. 30). Only one sample mean of *L. fluviatilis* (Stensam R., Sweden, Tab. 23; Hardisty, 1986c) and one of *L. planeri* (Rorum South R., Sweden, Tab. 30; Hardisty, 1986d) fall outside the 0.95 confidence interval for the mean of the sample of *Lampetra* (58.6 to 63.1; Table I).

The difference between the means of the two groups (ammocoetes of portuguese *Petromyzon* and *Lampetra*) is highly significant ($t = 14.115$; $P < 0.001$). There is no correlation between the number of trunk myomeres and the total length of the ammocoetes.

Pigmentation: As discussed above, the pigmentation characteristics are difficult to evaluate since most of the specimens have been preserved for a long time. But, in general, head and caudal surfaces are substantially more pigmented in *Petromyzon* ammocoetes than in *Lampetra* ammocoetes.

The tongue precursor is intensely pigmented in some *Petromyzon* specimens. In the majority, however, it is weakly pigmented or not pigmented at all. Two specimens of *Lampetra* have the tongue precursor well pigmented while the other four show no signs of pigmentation.

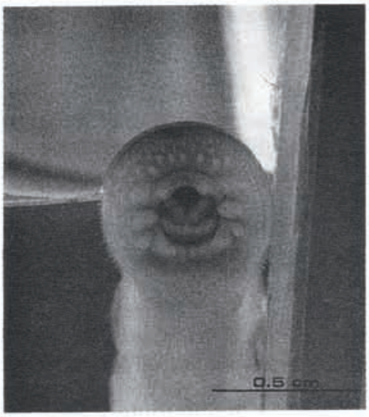

Fig. 1

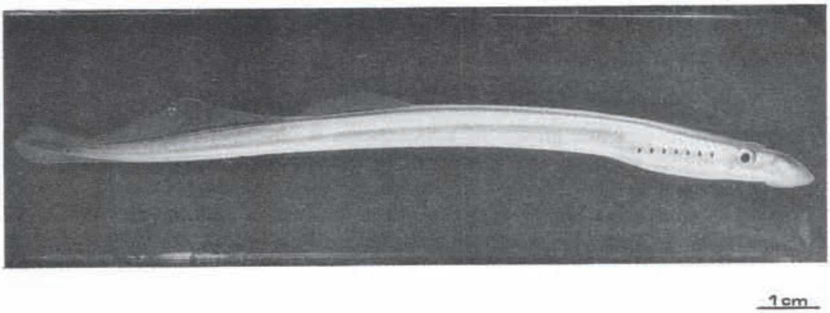

Fig. 2

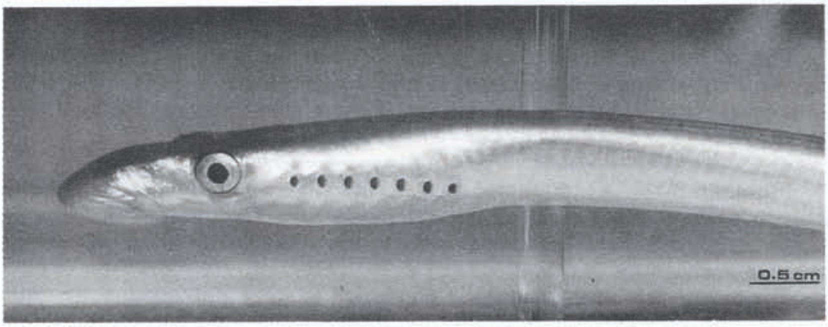

Fig. 3

Figs. 1-3 : *Lampetra fluviatilis* (Linnaeus, 1758). Prespawning adult collected in the river Sorraia (system of the Tejo). Photos taken from the living animal. Fig. 1 : Oral disc ; Fig. 2 : First and second dorsal fins prominent and well separated ; Fig. 3 : Detail of the fore region of the body. Lateral surface silvery. Ventral surface whitish.

Table I : Number of trunk myomeres in ammocoetes of *Petromyzon marinus* (Portugal) and *Lampetra sp.*

	Petromyzon marinus	***Lampetra sp.***
N	18	6
Ranges	70-76	58-63
$\bar{X}$	72.3	60.8
s^2	2.45	3.77
$s_{\bar{X}}$	0.38	0.87
0.95 confidence interval for mean	71.5 to 73.1	58.6 to 63.1
Correlation between the number of trunk myomeres and the total length	$r = -0.067$ (not significantly different from zero)	$r = 0.143$ (not significantly different from zero)

CONCLUSION

The occurrence of *L. fluviatilis* in the iberian peninsula is now a well-established fact. Therefore, it would perhaps be simpler to identify *Lampetra* ammocoetes as *L. fluviatis*. However, we do not do this because: (1) it is not known whether *L. planeri* lives in the iberian peninsula, and (2) further research on *Lampetra* ammocoetes (trunk sections and counting of oocytes) would not prove anothing since their origin is unknown.

Further research is needed to ascertain if *L. planeri* is present in the iberian peninsula.

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